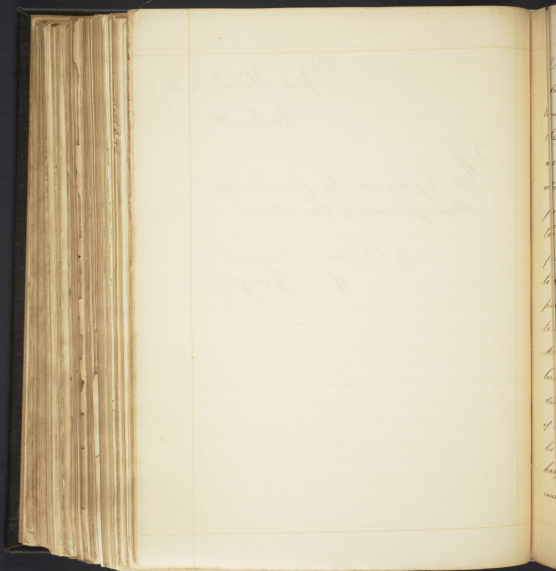


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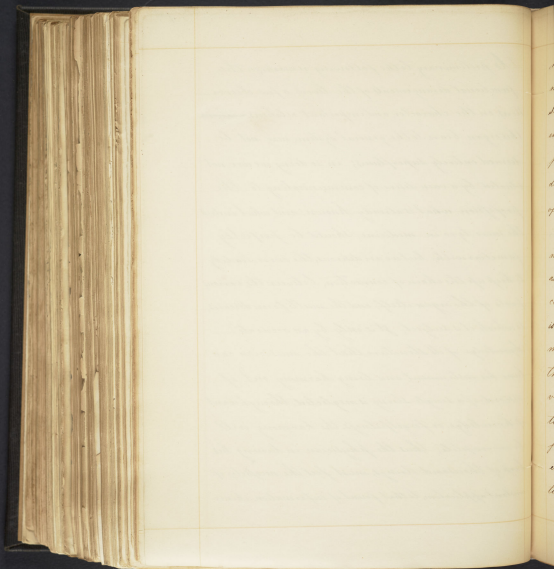
W. R. H.

An Essay on the functional  
derangements of the Liver.

by Elijah Davenport  
of Georgia.



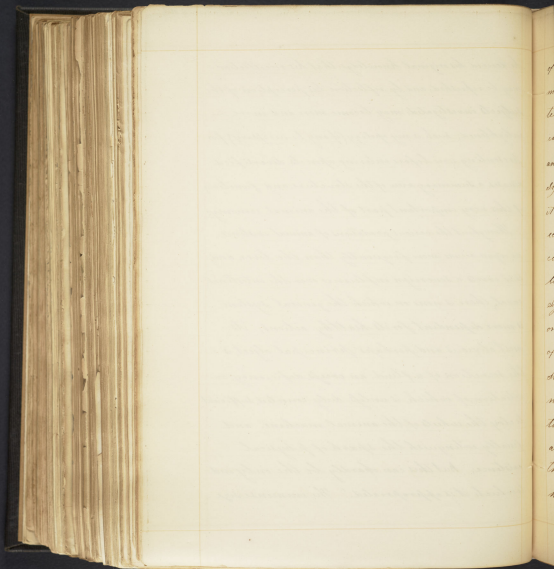
As preliminary to the following remarks, on the functional derangements of the liver; a few observations, on the character, and important relations, ~~relations~~ this organ bears to the general system, may not be deemed entirely superfluous; in so doing we are not actuated, by a vain desire of communicating to the profession, what is already known; and what indeed the mere tyro in medicine, should be perfectly familiar with; but we are desirous, the more readily to keep up the chain of connection, between the various parts of the organ itself, and the multi-form diseases, to which it is subject; It is only by an accurate knowledge of its structure, that the musician can tune his instrument and bring harmony out of discord; if a single string is neglected, through want of knowledge, or forgetfulness, the harmony will be incomplete; thus the physician in tuning his harp of thousand strings, must feel the necessity of constant application, to that fount of information, whence,



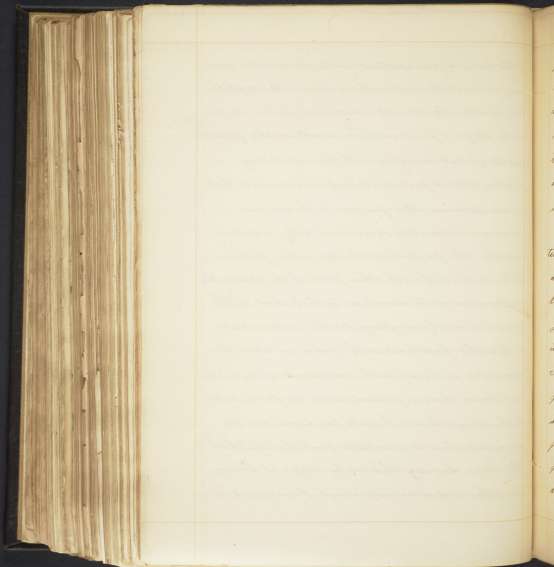


he derived his original knowledge: that his recollection may be refreshed, and by reflection his perceptions of the subjects investigated, may become more and more enlightened; such is my apology (if any be necessary) for presenting you before entering upon its diversified details, a summary view of the structure, and functions, of this very important part of the animal economy.

Throughout the various gradations of animal existence, no organ occurs more frequently than the liver, and as it exerts a sovereign influence over the intestinal canal, there is none in which the general system, is more dependent for its healthy actions; its most obvious and perhaps principal object, is the secretion of a fluid, an excess, deficiency, or vitiation, of which, is unless duly corrected, sufficient to clog the wheels of the animal machine, and finally extinguish the spark of physical existence; but this can hardly be the only end to which it is appropriated. "The immense size

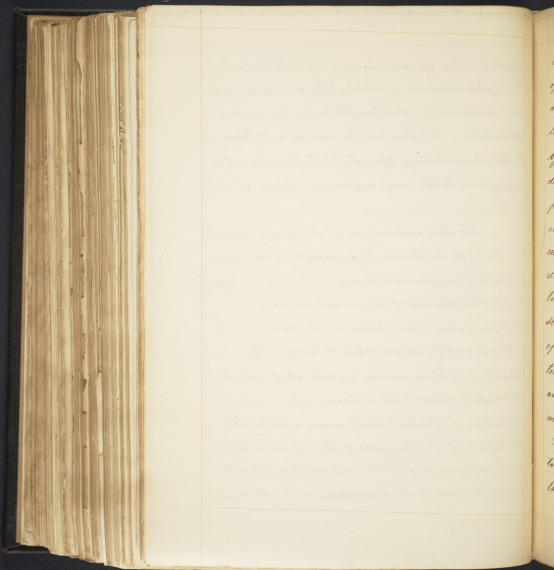


of the liver, says an excellent writer, the number and magnitude of the parts which compose its complicated vascular structure, its enormous magnitude, in the early stage of fetal existence, so well worthy of remark, and its special connection with the circulatory system, at that period, all lead us to conclude, that it answers some other purpose in the animal economy, besides the secretion of bile." when we consider the proportionate size of the fetal liver, compared with other parts of the glandular system, and at the same time reflect that little or no bile can be necessary for the performance of healthy functions in the fetus in utero, the stimulus natural to the intestines after birth not being here required, since no food passes to the stomach, and bowels, for digestion; we are compelled to grant the probability, that the liver, during this early stage of being, has other and more important functions to



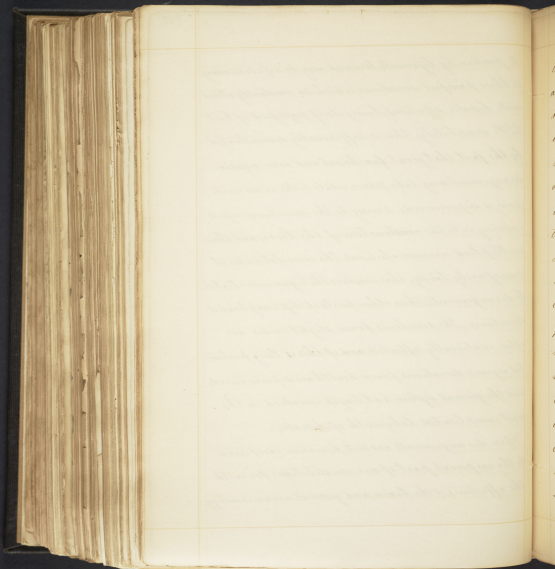
perform, than the mere secretion of bile; but what these functions are, or whether they are continued in more advanced life, has been the subject of curious speculation; This question however we will leave to the investigating spirit of philosophy, while we pass on to the more important parts of our subject.

The liver not only in its form and structure, but also in its secretory process, is an organ altogether sui generis, bearing little or no analogy to any other portion of the animal structure; Its organization differs from all the other viscera, in density, and firmness, and in its apparently consisting of a congeries of vessels, all of which probably tend to the ultimate object of secretion; but what still more marks the peculiarity of this organ, is that its secretory powers depend on a venous rather than an arterial influence; thus organized it is held in



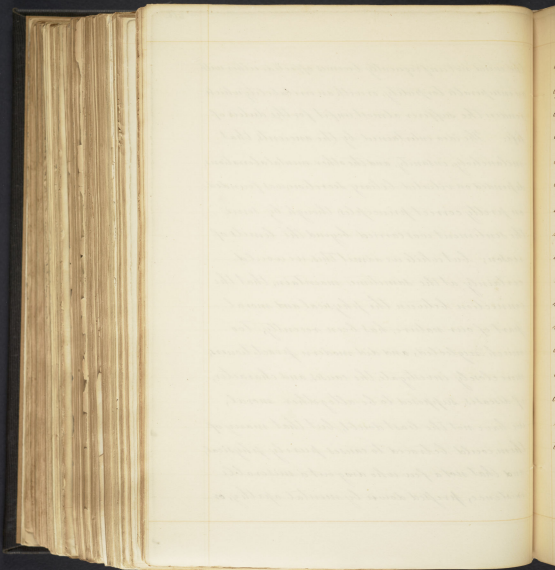
its position, by ligaments, &c. which may be referred many of these painful sensations, which so constantly attend acute hepatic affections, being itself possessed of but little sensibility; this is sufficiently demonstrated by the fact, that great functional and even organic derangement may take place, while little or no acute pain is experienced; owing to the number of vessels entering into the construction of the liver, and their multiplied circumvolutions, the circulation in it is necessarily tardy; this renders the organ more liable to derangements, than other parts of less complicated structure: The secretions from slight causes are often materially affected, and if this is long protracted, organic deviations from health are superinduced, and the general system is at length involved, in the most complicated labyrinth of disease.

These derangements are not however confined to the corporeal part of our constitution; for with the affections of the brain, and general nervous energy,

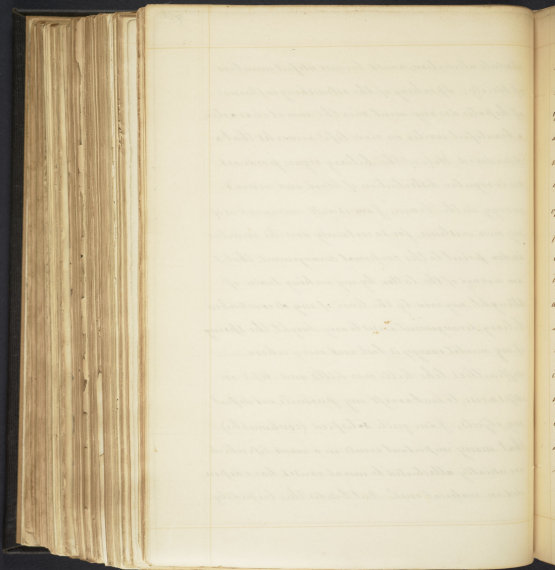




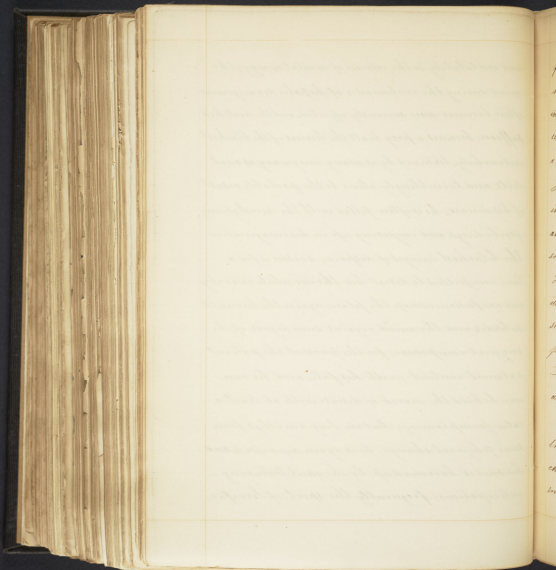
The mind not infrequently becomes affected, either with an insupportable torpidity, or with an irritability which renders the sufferer almost unfit for the duties of life. The idea entertained by the ancients, that melancholy, insanity, and the other mental aberrations, depended on vitiated biliary secretions, was founded on pretty correct principles, though by some the sentiment was carried beyond the limits of reason; but while we admit this, we would certainly, at the same time, maintain, that the connection between the physical and moral part of our nature, has been recently, too much neglected, and did modern practitioners, more closely investigate, the causes, and character, of diseases, supposed to be altogether moral, we have not the least doubt, but that many of them, could be traced to causes purely physical, and that not a few who drag out a miserable existence, pressed down by mental apathy, or



absolute alienation, would become useful members of society; speaking of the astonishing influence of hepatic derangement over the moral character, a beautiful writer on civic life remarks that a disordered state of the biliary organ, produces an irregular distribution of blood, and venous energy in the brain; "I am as well convinced as of my own existence, for so certainly does the mental index point to the corporeal derangement, that I am warned of the latter, by my waking train of thought, nay even by the tenor of my dreams; when biliary derangement arises to any height, the spring of my mental energy is lost, and every where difficulties, like hills over hills, and Alps on Alps arise, to embarrass my pursuits, and defeat my objects; I am quite satisfied (continued he) that many important events in a man's life, which are usually attributed to moral causes, have depended on material ones." But besides this torpidity-



and irritability, in the exercise of mental energy, the mind during the continuance of hepatic derangement often becomes more seriously affected, and the wretched sufferer becomes a prey to all the horrors of the blackest melancholy, tortured by as many imaginary as real evils, and tremblingly alive to the probable result of his disease, he is often filled with the most gloomy forebodings, and conjuring up in his imagination the blackest images of despair, reason is for a time compelled to desert her throne, while anarchy and confusion usurp the place, again the tumult subsides, and the mind regains some degree of its original composure, for the present the patient is almost content with his fate, and he can now behold the march of disease with at least a calm complacency, but ere long, doubtless from some physical change, he is again depressed, and his soul is harrowed up by the most torturing anticipations, frequently the sport of terrific

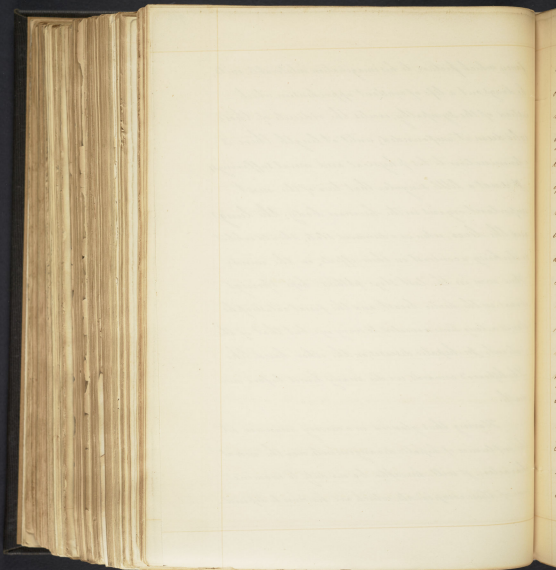


fancy, which picture to his imagination intolerable evils; he drags out a life of constant apprehension, which — instead of the sympathy, excites the ridicule of those who deem it unfounded; until at length there is a termination to his physical and moral sufferings;

It is not a little singular that two of the most important organs in the human body; the lungs and the liver, when in a disordered state, should exhibit so striking a contrast in their effects, on the mind;

Thus even in the last stage phthisis, hope springs eternal in the hectic breast, and the fiscal catastrophe stands a long time revealed, to every eye, but that of the patient; In hepatic diseases, on the other hand, like Shakespeare's cowards, we die many times before our death.

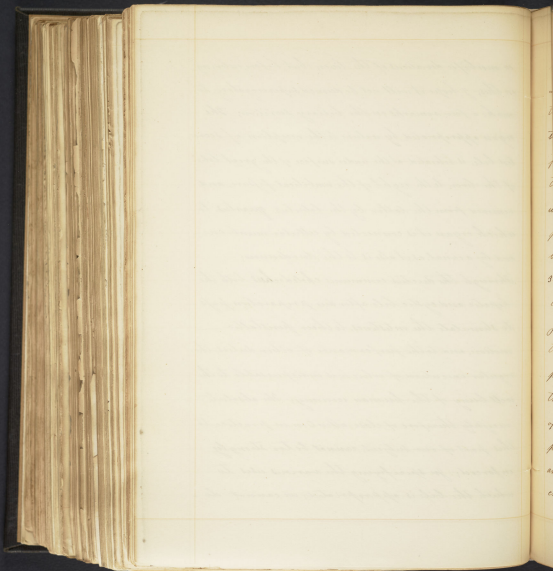
Having thus glanced in a cursory manner at the influence of hepatic derangements, over the moral character; it will hereafter be our duty to examine some of those complaints, which are known to depend —



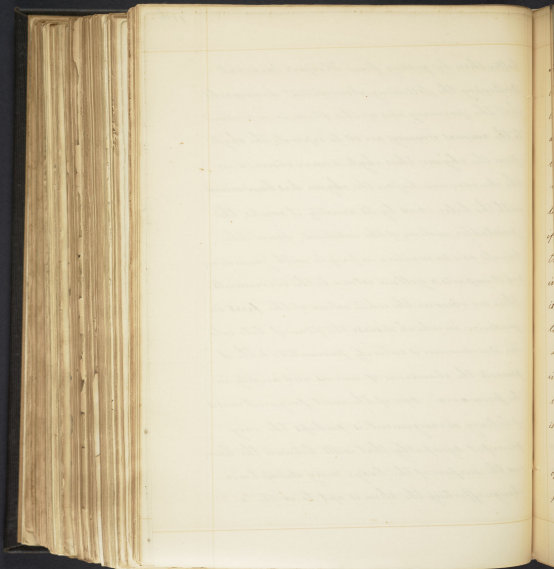


in multiple deviations of the liver, but before entering on this, I hope it will not be deemed supererogatory, to make a few remarks on the biliary secretion; the organ appropriated by nature to the reception of secreted bile, is situated at the under surface of the great lobe of the liver, to the right of the umbilical fissure, and removed from the latter by the lobulus quadratus, to which organ it is connected by cellular membrane and by a canal, as it also is to the duodenum;

Through the ductus communis choledochus both the hepatic and cystic bile after due preparation pass to stimulate the intestines, to their peristaltic motion, and to the performance of other duties, the regular execution of which, is indispensable to the well being of the human economy; the absolute necessity therefore of close attention in practice to this part of our subject, cannot be too strongly enforced; In specifying the various uses to which the bile is appropriated; we cannot do —

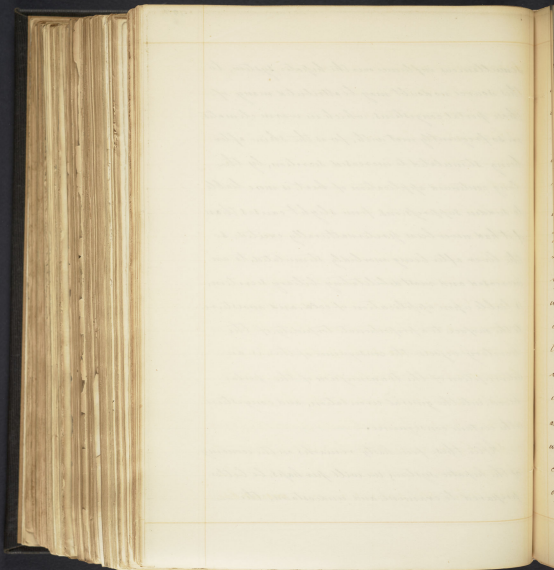


better, than by quoting from Hooper's Medical  
 Dictionary the following observations, "he remarks  
 that the primary use of this fluid, so important  
 to the animal economy, are 1<sup>st</sup> to separate the chyle  
 from the chyme; thus chyle is never observed in  
 the Duodenum before the chyme has been mixed  
 with the bile: and by its acridity it excites the  
 peristaltic motion of the intestines; hence the  
 bowels are so inactive in people with jaundice;  
 3<sup>rd</sup> it imparts a yellow colour to the excrements;  
 thus we observe the white colour of the feces in  
 jaundice, in which disease the flow of bile into  
 the Duodenum is entirely prevented; 4<sup>th</sup> it  
 prevents the abundance of mucus and acidity in  
 the primæviæ." one of the most frequent causes  
 of biliary derangement is perhaps the very  
 powerful sympathy that exists between the liver,  
 and the surface of the body, every atmospheric  
 change, affecting the skin, is apt to excite a



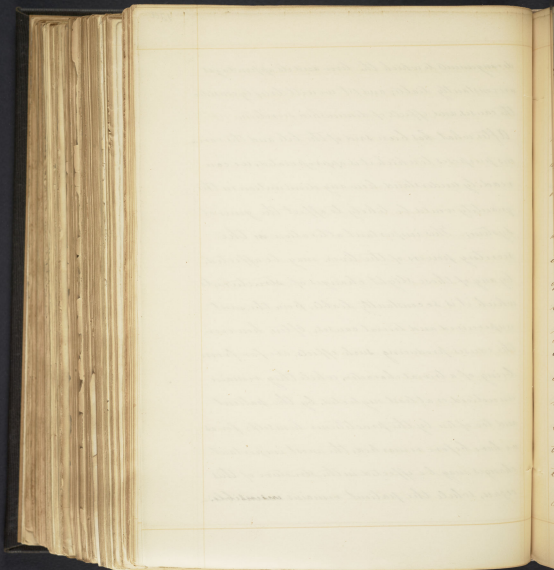
simultaneous influence over the hepatic system, to this source no doubt may be attributed many of those portal congestions, which in warm climates, are so frequently met with, for as the skin after being stimulated to increased secretion, by the long continued application of heat, is more liable to sudden suppressions, from slight causes, than if it had never been proternaturally excited; so the liver after being morbidly stimulated, to an increased and most debilitating biliary secretion, is liable upon application of cold, and moisture to the surface, to a proportionate torpidity, of the secretory vessels; the consequence of this, is an interruption of the transmission of the portal blood, into the general circulation, and congestion is the certain consequence.

After these few hasty remarks on the economy of the hepatic system we will perhaps, be better prepared to examine, and understand, the



derangements to which the liver and its appendages are constantly liable; and 1st we will briefly consider the causes, and effects, of diminished secretion.

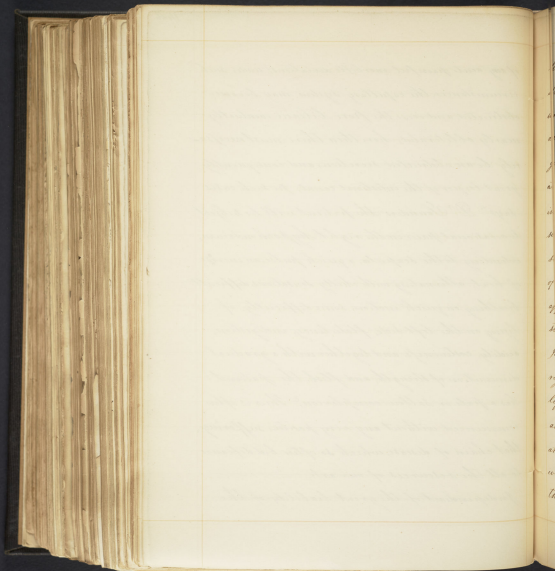
After what has been said of the bile and the various purposes to which it is appropriated, we can readily understand how any diminution in the quantity would be likely to affect the general system; This important alteration in the secretory powers of the liver, may be affected, by any of those slight changes of structure, to which it is so constantly liable, from the most unperceived and trivial causes. Often however the causes producing such effects, are far from being of a trivial character, while they remain unnoticed, or at least neglected, by the patient and too often by the practitioner himself; for as we have before remarked, the most important changes may be effected in the structure of this organ, while the patient remains insensible.



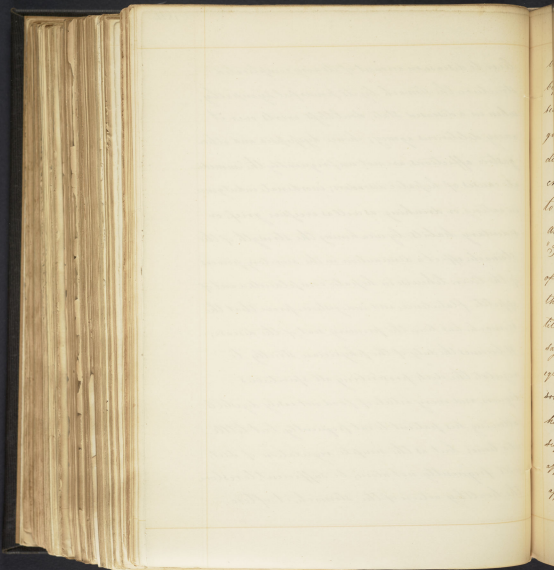


of any acute painful morbid deviations; under such circumstances, the capillary system may become obstructed, and even the *Fori Biliaria* eventually nearly obliterated; here then there must necessarily be an obstructed secretions, and consequently, great torpor of the intestinal canal; for such cases says "Dr Saunders" the patient will be subject to occasional pains in the right hypochondrium, extending to the scapula, a quick pulse, an increase of heat, alternating with chilly sensations, difficult breathing on quick motion, some difficulty of lying on the left side, flatulency, indigestion, acidity, costiveness, and together with a gradual diminution of strength, and flesh, the patient has a pale or sallow complexion." Thus is often commenced without any very positive suffering, that chain of disease, which so often bid defiance to all the resources of our art.

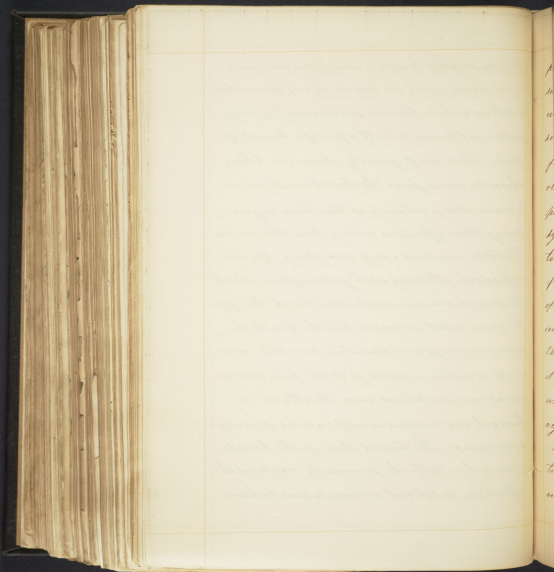
Independent of the great liability of the



liver to disease, on account of its very complicated structure, the stomach by its powerful sympathy, when in a diseased state, doubtless exerts over it a very deleterious agency; hence dyspepsia and other gastric affections, are not unfrequently the immediate causes of hepatic disorders; inordinate indulgence in eating, or drinking, as well as excessive grief, or sedentary habits, by weakening the strength of the stomach, effect a diminution in the secretory powers of the liver; likewise in hepatic complaints, want of appetite, flatulence, and indigestion, prove that the stomach, has been the primary seat of the disease; It becomes the duty of the physician strictly to regulate the diet, proscribing all spirituous liquors, and every article of food not easily digestible; allowing his patient to eat frequently, but little at a time; but as the simple regulation of diet, will frequently not alone, be sufficient to restore the healthy action of the stomach, it often —

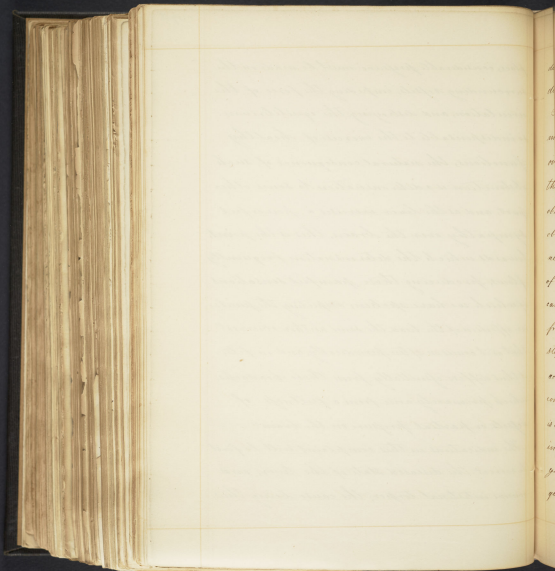


becomes necessary to resort to chalybeates and tonics, before we can effect the desired object; diminished secretion of bile, however independent of any gastric influence, is itself a prolific source of disease; these are frequently obscure in their character, and require the closest investigation, to arrive at any certainty of their true origin; among other affections arising from this source Faithorn mentions a very distressing species of headach, attended with giddings, in which the stomach remains unaffected, though the appetite is somewhat increased but the bowels he says are always in a slow state from their inadequate secretion, or invertings of the bile; and as soon as accumulations occur, the attack of headach and various modifications of vertigo supervenes. The torpid state of the bowels, appears here to be the proximate cause of the affection; intestinal accumulations taking-



place, considerable pressure must be made on the surrounding vessels, impeding the force of the circulation, and destroying the equilibrium, so indispensable to the exercise of healthy functions, the natural consequence of such obstruction is a determination to some other part, and as the liver exercises a powerful sympathy over the brain, this is the point, towards which the determination frequently flows, producing those painful sensations of which we have spoken; respecting the peculiar affection of the head, the same author observes "that as it comes on often periodically, and in fits, it thus differs essentially from those headaches, which primarily arise from a fullness of vessels, or partial pressure on the brain."

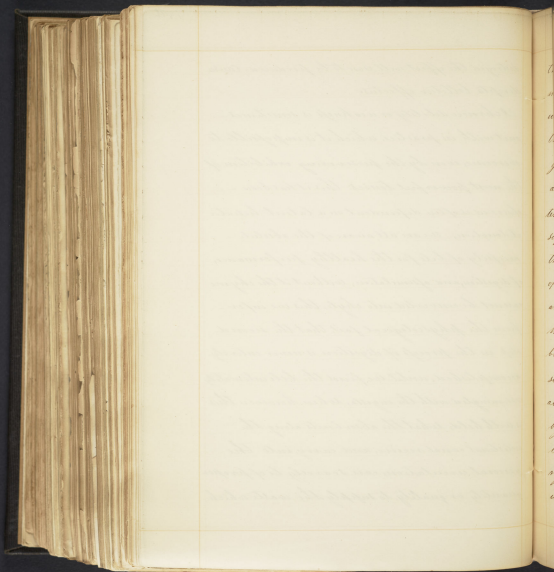
The indications in this complaint will be first to correct the diseased state of the liver, and remove intestinal torpor, the cause being thus



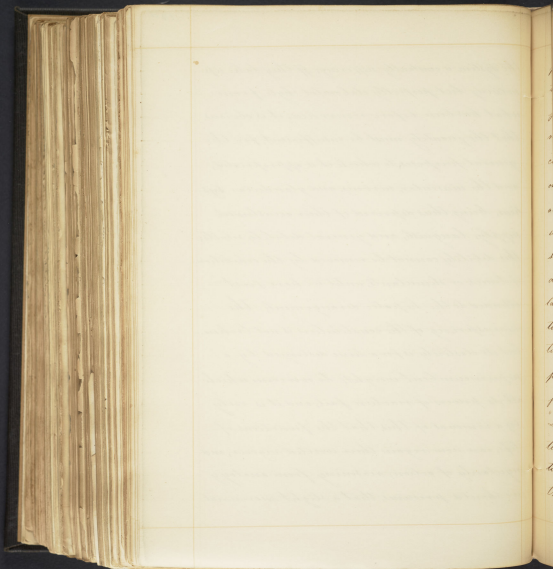


destroyed the effect will cease to be produced: *Causa destruit totum effectum.*

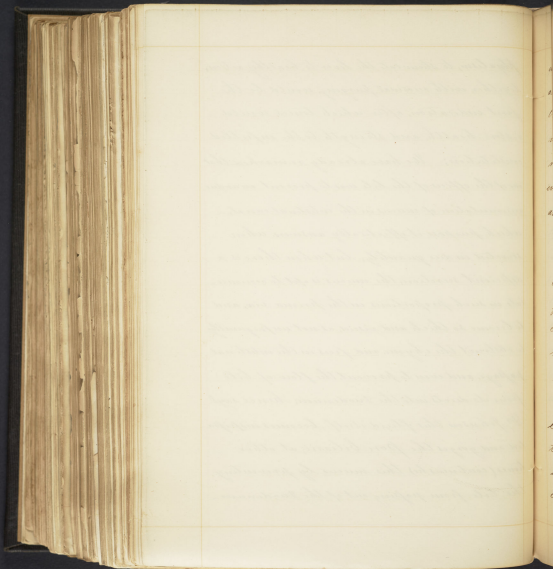
Chronic debility or weakness is sometimes met with in practice, which it is impossible to overcome, even by the persevering exhibition of the most powerful tonics. This it has been observed is often dependent on a latent hepatic obstruction; we are all aware of the absolute necessity of bile for the healthy performance of digestion, and assimilation; without it the chyme cannot be converted into chyle, this we infer from the physiological fact, that the second step in the process of digestion is never entirely accomplished, what we find the biliminutally commingled with the ingesta, when however this is withheld, what the absorbents along the intestinal canal receive, and carry, into the general circulation, can scarcely be of proper quantity or quality, to supply the waste which



the system is constantly suffering; If they take up nothing but perfectly elaborated chyle, from what has been before remarked, it is obvious, that the quantity must be insufficient, for the general purposes, to which it is appropriated, and the muscular, nervous, and glandular systems, being thus deprived of their accustomed supply, languish, and general debility results; this debility cannot be removed by the exhibition of tonics or stimulants, until we have first attended to the hepatic disarrangement; the mainspring of the constitution is not broken, but its elasticity is for a time destroyed by a superincumbent weight; to overcome which all its powers of reaction fail, and it is only by a removal of this, that the functions of life, can now regain their wonted vigour, and regularity of action; reasoning from analogy we should presume, that a slight mercurial



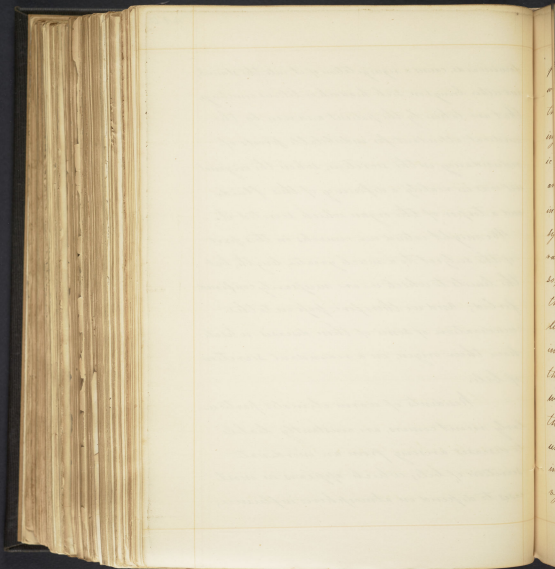
ptyalism, to stimulate the liver to healthy action,  
 together, with occasional purging, would be the  
 first indication, after which tonics would  
 restore health, and strength to the enfeebled  
 constitution; We have already remarked that  
 one of the offices of the bile was to prevent an undue  
 accumulation of mucus in the intestinal canal,  
 which purpose it effectually answers, when  
 secreted in due quantity, but when there is a  
 deficient secretion, the mucus is apt to accumu-  
 late in such proportions in the *primæ viæ*, and  
 to become so thick and viscid, as not infrequently  
 to obstruct the chyme, and feces in the intestinal  
 passage, and even to prevent the flow of bile  
 from its ducts into the Duodenum; hence says  
 Dr. Johnson this fluid itself becomes inspissated  
 and gorges the *pori biliaris*; at other  
 times (continues he) this mucus by preventing  
 the bile from passing out of the Duodenum-



downwards, causes a regurgitation of it into the stomach, and either brings on such headach, or bilious vomitings that are taken by the patient and even by the medical attendant for indubitable proofs of redundancy in the secretions, when the original evil was in reality a deficiency of this fluids, and a torpor of the organ which secreted it.

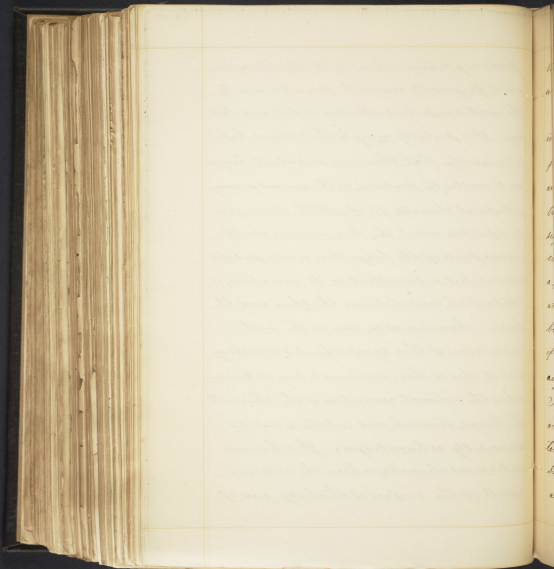
We might extend our remarks on this part of the subject to a much greater length, but the limits to which we are necessarily confined forbid; and we therefore pass on to the consideration of some of those diseases which have their origin, in a redundant secretion of bile.

Residents of warm climates particularly recent comers, are constantly liable to diseases arising from an inordinate secretion of bile, which appears in most cases to depend on atmospheric influences,



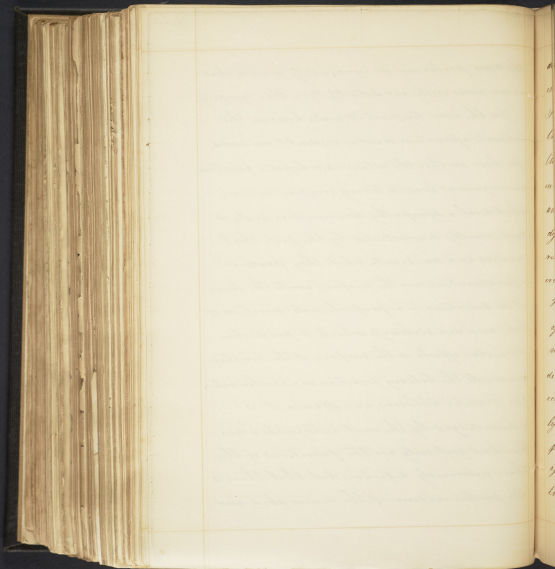


producing determinations to the hepatic system, which frequently cannot be prevented even by the most scrupulous attention to diet, and clothing. It is probably owing to the cutaneous hepatic sympathy, that those very important changes are so constantly produced, on the arterial economy, in tropical climates; for of all the diversified sympathies, which the liver, exercises, over the various parts of the body; there is none perhaps, so powerful or so constant in its operation, as that which exists between the skin and the liver. Knowing as we now do the vast importance of this sympathy, it is astonishing that it should have remained so long unknown, when the intimate connection of the skin with the lungs, stomach, and intestines, was so universally acknowledged. It is however in tropical climates, where the extreme heats on the surface of the body, and of



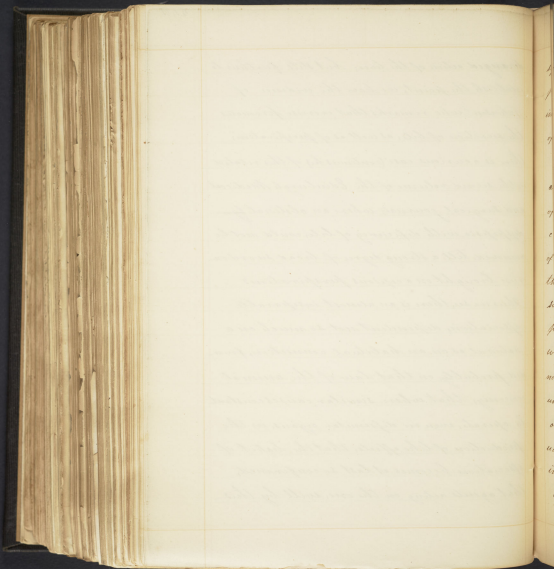
the *Vesæ portarum* are inordinately excited, that we can more easily and distinctly trace their sympathy.

In the more temperate climates, however, this intimate association is not so evident to our senses, for here neither the cutaneous, or hepatic functions, are in general excited to very excessive actions; that such a sympathy however, does exist, is sufficiently demonstrated by the fact, that emetics and nauseants, while they produce a perspiration over the surface, excite the liver at the same time to a proportionate secretion of bile, and sea sickness which is productive of similar effects on the surface, at the same time augments the biliary secretion in a similar ratio. In Diabetes, Chlorosis, and Mania, it is acknowledged by the most distinguished writers, that not only are the functions of the skin, notoriously defective, but that there is also positive evidence of the diminished and



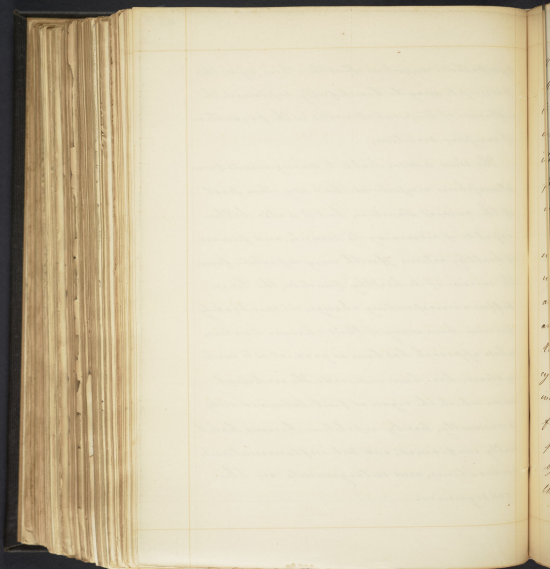
deranged action of the liver; but still further to establish the point, we have the evidence of Johnson "who remarks that exercise promotes the secretion of bile, as well as of perspiration"; there is a curious case (continues he) of this related in the second volume of the Edinburgh Medical and Surgical journal; where an obstinate ~~of~~ dyspepsia with deficiency of bile, could not be removed, till a strong degree of broad sword exercise brought on a copious perspiration?

Thus we see, there is an almost inseparable association, dependent not so much on a natural as on an habitual connection, founded probably, on that law of the animal economy, that where similar causes constantly operate, even on dissimilar organs, in the production of like effects, that the habit of association becomes at last so confirmed, that agents acting on the one, will by this-



sympathetic connection affect the others: Upon this principle may be beautifully explained, the influence of tropical climates, in the production of excessive secretions;

The skin is more liable to derangements from atmospheric vicissitudes, than any other part of the animal structure, but it is also better capable of recovering its torvicity, and powers, of healthy action; With every departure from the exercise of its healthy function, the liver suffers a corresponding change, we can readily perceive how many of those chronic disorders, whose approach has been so gradual as to excite no alarm, have been induced. The excitement under which the organ at first laboured only occasionally, has by repetition become habitually confirmed, and sub inflammations, indurations, and enlargements are the consequence. — — — — —

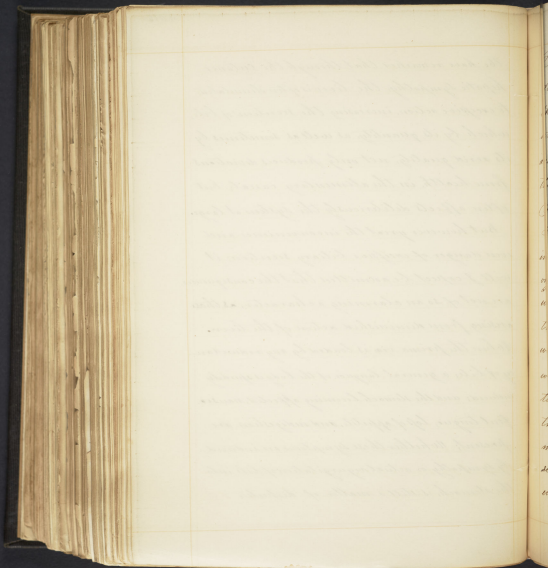




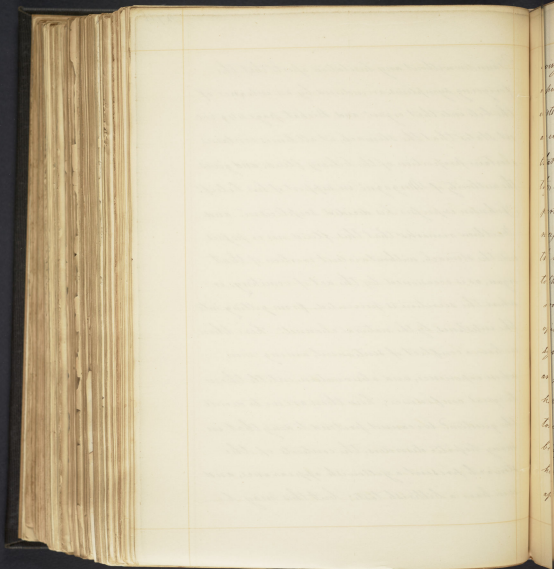
We have remarked that through the cutaneous hepatic sympathy, the liver is often stimulated to excessive action, increasing the secretion of bile, which by its quantity, as well as sometimes by its acrid quality, not only produces deviations from health, in the alimentary canal, but often affects deleteriously the system at large.

But however great the inconvenience and even danger of excessive biliary secretion; it will I expect be admitted that the consequences are not of so an alarming a character, as those arising from diminished action of the liver.

When the *prima via* is loaded by any redundancy of bile; a general languor of the body is speedily induced; and the stomach becoming affected, nausea, foul tongue, loss of appetite, and indigestion are present; Whether these symptoms are induced, by sympathy or actual regurgitation of bile into the stomach, is still a matter of dispute.

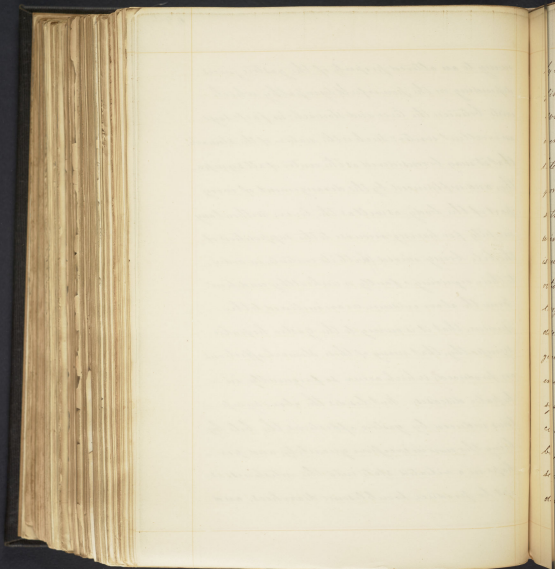


"Saunders without any hesitation asserts" that the  
 foregoing symptoms are induced by an intrusion of  
 the bile into that organ" and Bichat page 449 vol  
 1st states that the stomach, at all times contains  
 a certain proportion of the biliary fluids, and gives  
 the authority of Morgagni in support of his belief.  
 Johnson expresses his decided scepticism, and  
 Faithorn remarks that this fluid never passes  
 into the stomach, without violent exertion of that  
 organ, as is occasioned by the act of vomiting, or  
 where the secretion is prevented, from getting into  
 the intestines, by the natural channel." Here then  
 we have a conflict of sentiment among men  
 whose experience, and observation, entitle them  
 to equal confidence; how then are we to decide  
 the question? We cannot pretend to deny that in  
 many hepatic disorders, the contents of the  
 stomach present a yellowish appearance, and  
 even have a bitterish taste; but this may be

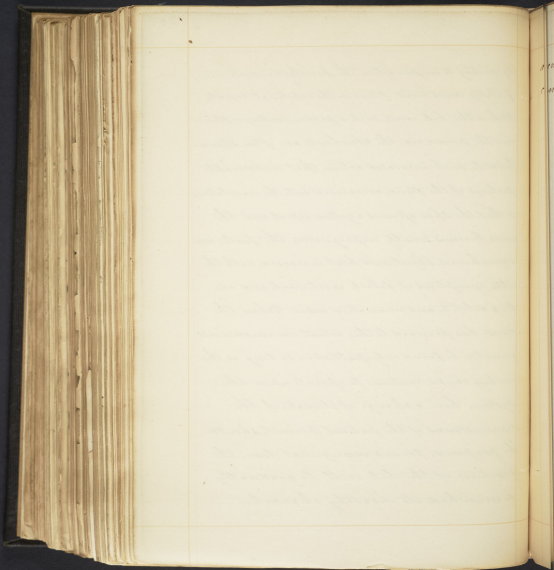


owing to an altered property of the gastric juices, depending on the powerful sympathy which exists between the liver and stomach; in fact says an excellent writer: "such is the nature of the stomach, that it may be considered as the centre of all sympathy, and influenced by the derangement of every part of the body, as well as the liver, without any necessity for having recourse to the suppression of the bile being mixed with its contents, in order to their acquiring a faulty or unhealthy condition."

From the above evidence, we are inclined to the opinion, that it is owing to the Gastro hepatic sympathy, that many of those Stomach affections are produced; which occur so frequently in hepatic diseases; But besides the above symptoms induced by gastric affections, the bile by being thrown in excessive quantity, and perhaps in a vitiated state into the intestines, is apt to produce troublesome diarrhoeas, and



by exciting to excessive action, the peristaltic motion,  
 finally causes want of tone in the intestinal canal,  
 When the bile exerts such a predominating influence  
 over the primum via, the absorbents are often stimu-  
 lated to such increased action, that considerable  
 portions of the fluids, are carried into the circulation,  
 so that the skin assumes a yellow aspect, and the  
 urine becomes sensibly impregnated, the pulse now  
 is quickened, thirst, and heat increased, with the  
 other symptoms of febrile excitement, and ex-  
 treme debility and evacuations ensue; When the  
 disease has proceeded to this extent, our remedies will  
 generally be found only palliative, so long as the  
 exciting causes, continue to operate upon the  
 system, here a change of climate, if the  
 circumstances of the patient permit, should  
 be proposed, for in a more genial clime, the  
 secretions of the bile will be gradually  
 diminished, its healthy character.





recovered, and the stomach and intestinal  
canal restored, to their healthy functions.

